

(b) optical head moving means adapted to be arranged on one side of an optical disc loaded in said apparatus, for moving said optical head relative to the optical disc loaded in said apparatus to traverse a recording thereof;

wherein said optical means comprises different effective numerical apertures for converging the light flux on said information layer of corresponding one of said N types of optical discs and said optical means converges said light flux as a smaller spot diameter D by employing a larger one of said numerical apertures, with respect to one of said optical discs having a thinner one of said substrates, and

wherein thicknesses of said transparent substrates of said N types of optical discs are about 1.2mm or less than 1.2mm.

87. An optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where  $N \geq 2$ ) of optical discs having first layers of different thicknesses, each type of said optical discs having at least said first layer being transparent and a second layer for storing information, by converging a light flux onto said second layer through said first layer, said apparatus comprising:

(a) an optical head including (i) light emitting means for emitting said light flux, (ii) optical means for converging said light flux onto said second layer, and (iii) at least one photo detecting means for detecting reflected light from the optical disc; and

(b) optical head moving means adapted to be arranged on one side of an optical disc loaded in said apparatus, for moving said optical head relative to the optical disc loaded in said apparatus to traverse a recording track thereof;

wherein said optical means comprises different numerical apertures for converging the light flux on said first layer of corresponding one of said N types of optical discs and said optical means converges said light flux as a smaller spot diameter D by employing a larger one of said effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers, and

wherein thicknesses of said first layers of said N types of optical discs are about 1.2mm or less than 1.2mm.

88. An optical recording/reproducing system comprising:

an optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where  $N \geq 2$ ) of optical discs having transparent substrates of different thicknesses, each type of said optical discs having at least said transparent substrate and an information layer, by converging a light flux onto said information layer through said transparent substrate, said apparatus comprising:

(a) an optical head including (i) light emitting means for emitting said light flux, (ii) optical means for converging said light flux onto said information layer, and (iii) at least one photo detecting means for detecting reflected light from the optical disc; and

(b) optical head moving means adapted to be arranged on one side of an optical disc loaded in said apparatus, for moving said optical head relative to the optical disc loaded in said apparatus to traverse a recording thereof;

wherein said optical means comprises different effective numerical apertures for converging the light flux on said information layer of a corresponding one of said N types of optical discs and said optical means converges said light flux as a smaller spot diameter D by

employing a larger one of said numerical apertures, with respect to one of said optical discs having a thinner one of said substrates,

wherein thicknesses of said transparent substrates of said N types of optical discs are about 1.2mm or less than 1.2mm,

(c) a system controlling means coupled to said converging means for moving said converging means relative to the optical discs loaded in said apparatus to traverse a recording track thereof; and

(d) a signal processing means coupled to said photo detecting means for encoding or decoding said information signal.

89. An optical recording/reproducing system comprising:

an optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where  $N \geq 2$ ) of optical discs having first layers of different thicknesses, each type of said optical discs having at least said first layer being transparent and a second layer for storing information, by converging a light flux onto said second layer through said first layer, said apparatus comprising:

(a) an optical head including (i) light emitting means for emitting said light flux, (ii) optical means for converging said light flux onto said second layer, and (iii) at least one photo detecting means for detecting reflected light from the optical disc; and

(b) optical head moving means adapted to be arranged on one side of an optical disc loaded in said apparatus, for moving said optical head relative to the optical disc loaded in said apparatus to traverse a recording track thereof;